Goddard Space Flight Center SPI

GSFC

An Overview of Tools Available on the SPI Website

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Software Process Improvement (SPI) Project

April, 2008

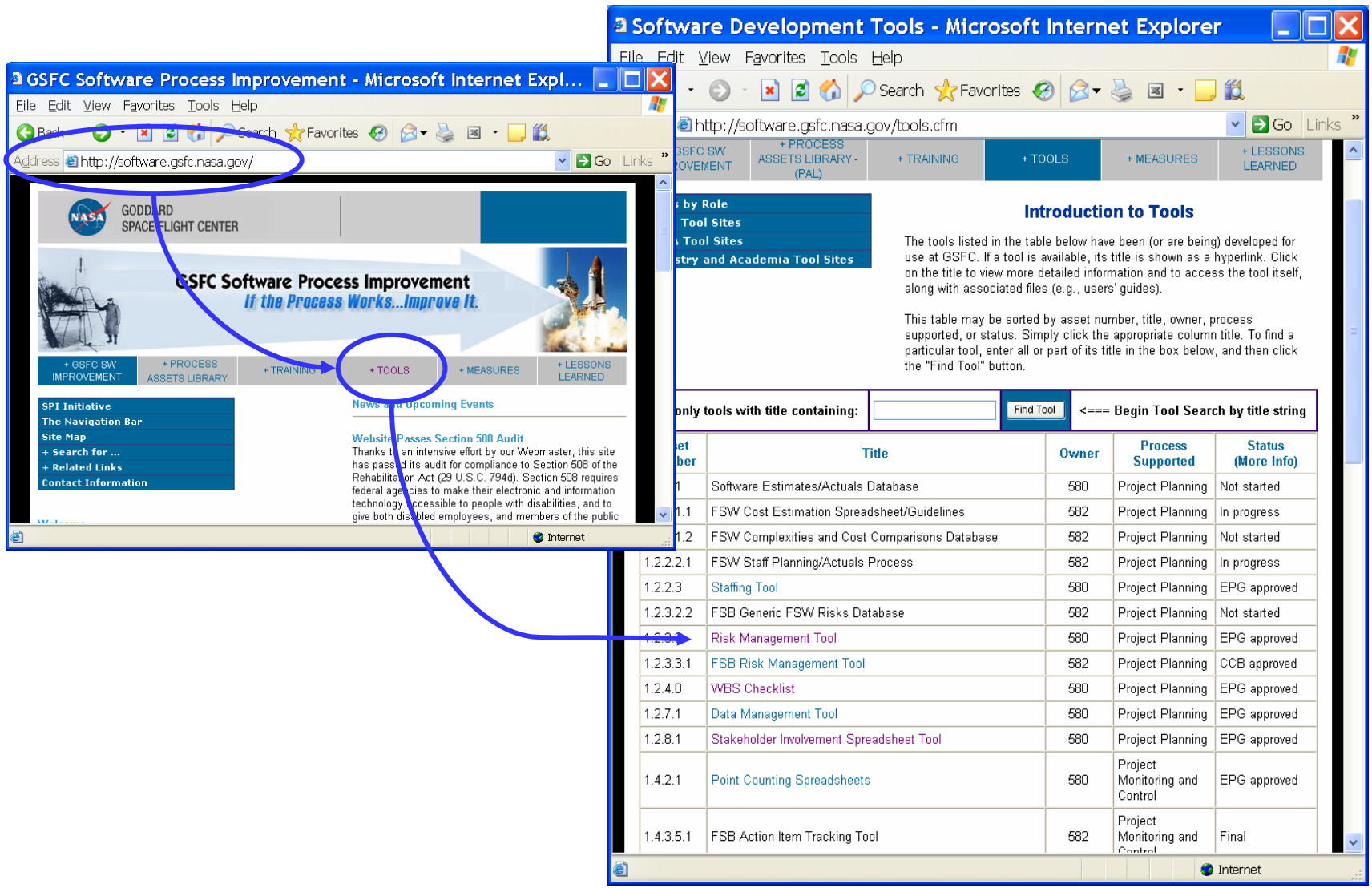
Purpose and Objectives

- **Purpose: Introduce the audience to the tools provided on the Software Process Improvement Website**
- **Objective - After this session you should understand:**
  - **Where the tools are located and how to find them**
  - **What specific tools are available**
  - **The breadth of free tools available to projects to help them meet the requirements of NPR 7150.2**

Tool Availability

- SPI has been developing tools to aid in project management and in meeting many of the CMMI and NPR requirements
- Some of tools have been developed with smaller projects in mind -- those that may not have other tools available
- The tools are available from the Software Process Improvement Website
  - Go to http://software.gsfc.nasa.gov/ and click the Tools tab
  - Search on a keyword (e.g., risk, schedule, WBS) to find related tools
  - Click the name of the tool to download
  - One exception is the Branch Status Review (BSR) Template, found at http://software.gsfc.nasa.gov/AssetsApproved/PA1.4.3.4.ppt

Getting to the Tools



Asset Number	Title	Owner	Process Supported	Status (More Info)
1	Software Estimates/Actuals Database	580	Project Planning	Not started
1.1	FSW Cost Estimation Spreadsheet/Guidelines	582	Project Planning	In progress
1.2	FSW Complexities and Cost Comparisons Database	582	Project Planning	Not started
1.2.2.2.1	FSW Staff Planning/Actuals Process	582	Project Planning	In progress
1.2.2.3	Staffing Tool	580	Project Planning	EPG approved
1.2.3.2.2	FSB Generic FSW Risks Database	582	Project Planning	Not started
[illegible]	Risk Management Tool	580	Project Planning	EPG approved
1.2.3.3.1	FSB Risk Management Tool	582	Project Planning	CCB approved
1.2.4.0	WBS Checklist	580	Project Planning	EPG approved
1.2.7.1	Data Management Tool	580	Project Planning	EPG approved
1.2.8.1	Stakeholder Involvement Spreadsheet Tool	580	Project Planning	EPG approved
1.4.2.1	Point Counting Spreadsheets	580	Project Monitoring and Control	EPG approved
1.4.3.5.1	FSB Action Item Tracking Tool	582	Project Monitoring and Control	Final

Tool Introduction

- Some tools are Word files that provide a template or suggested boilerplate that can assist in planning activities
- Many tools are Excel Spreadsheets that can assist in planning process activities and tracking progress of those activities
- Each tool has either embedded guidance (for Word) or a Users Guide worksheet (for Excel)

List of Tools Available

Tool	Project Planning	Project Monitoring and Control	Requirements Management	Configuration Management	Process and Product Quality Assurance	Risk Management	Measurement and Analysis
Action Items Tracking Tools (spreadsheet and web-based)		X					
Audit Findings and Corrective Actions Tool		X			X		
Basis of Estimate Guidance	X						
Branch Status Review Template **	X	X					
Change Request Form			X	X			
Change Request Log			X	X			
CM Baselines Template				X			
Data Management Tool	X	X		X			
Inspection Metrics Tool		X					X
Inspection Moderator's Tool		X					X
ISD Measurement Collection Spreadsheet		X					X
Issues Tracking Tool		X					
Measurement Summary Tool		X					X
Meeting Minutes Template		X					
Point Counting Spreadsheets		X					
Problem Report Tool		X					X
Repository (web-based)		X					
Requirements Traceability Tool			X				
RID Form **		X					
Risk Management Tool	X	X				X	
Roles and Responsibilities List	X						
Scheduling Tool	X	X					
SMP/PP Boilerplate	X						
Staffing Tool	X	X					
Stakeholder Involvement Spreadsheet Tool	X	X					
Training Tool	X	X					
WBS Checklist	X						

**** These two tools are found in the Process Asset library at http://software.gsfc.nasa.gov/ISDpaAll.cfm**

Action Item and Issue Spreadsheets

- **Action Item (AI) Tracking Tool* allows the user to**
  - **Assign an AI numbering scheme**
  - **Log project actions and the date they were opened**
  - **Assign staff to work the AI toward a specific due date**
  - **Provide status of each AI on an ongoing basis**
  - **Track each AI to closure**
  - **Generates an AI Tracking Log report that contains**
    - **Number of AIs Open, Number of AIs Closed, and Average Days to Close AIs**
- **Issue Tracking Tool allows the user to**
  - **Describe the issue**
  - **Provide analysis of the issue and its impact on the project**
  - **Define or refer to an action plan put in place to resolve the issue**
  - **Provide status of each issue on an ongoing basis**
  - **Track each issue to closure**

* There is also a web-based action tracking tool available.

Examples of Action Item and Issue Logs

ABC Action Items Tracking Log

Report Date: 03/06/06

Total AIs Open: 3
Total AIs Closed: 1
Average Days to Close: 50

AI ID	Action Item	Assigned To	Date Opened	Date Due	Date Closed	Days Open	Notes / Status
1	Come up with some text to fill in the blank areas of the web site (e.g., "About this Site")	Jody	12/15/05	02/06/06	02/06/06		02/06/06: Text submitted to the webmaster. 12/15/05: Eight areas on the web site are empty and need text added.
2	Prepare a more useful way of reporting metrics at management reviews	Mike	12/15/05	03/08/06		81	02/06/06: review comments incorporated and draft completed, but Mike needs to meet with mgmt to finalize. 01/15/06: first draft distributed for review.
3	Order the CM tool	Sue	01/06/06	03/08/06		59	03/06/06: Difficulties in contacting the vendor have delayed completion of the PO. 02/06/06: Team reviewed the CM Tool options and decided to purchase the xyz tool. (See Make/Buy analysis on CM Tool). Sue to write up the purchase order.
4	Contact Archie about the latest changes in the interface to the YOUOWN system.	Dave	03/01/06	04/15/06		5	03/06/06: New

Action item log provides statistics

ABC Issues Log — As of: 01/25/07

Issue	Analysis / Impact	Action Plan	Status
None	<analysis here> **Impact:**		MM/YY:
CM procedures document has been stalled for months	So-and-so created a very early draft, but then decided to wait for the CM Plan to solidify. That happened, but no one picked up the CM procs doc again. **Impact:** Teams will be unable to consistently and correctly apply CM procedures without this document.	John Doe will ask the Branch for some of So-and-so's or So-and-so-Jr's time to finish this document. Action Due Date: 06/01/06	08/06: New issue this month.
Project eliminates one C&DH ETU to save costs	This ETU was to be dedicated to the FlatSat. Now FlatSat and HW team will share one ETU. **Impact:** FSW System test schedule could be delayed when HW takes the ETU.	Details of this Action Plan are being tracked as Action Items 13, 14, and 15 in the Project Action Item list.	08/06: Risk has been raised to project "top ten." A number of mitigation options are being considered. 07/06: No change. Project has taken no action to mitigate this risk. 06/06: This has been raised as a risk in the project's risk system. 04/06: New issue this month.

Issues log provides an action plan

Audit Findings and Corrective Actions Tool

- Used to capture results from process and product audits and the status of any corrective actions
- Allows the user to:
  - Record audit dates and type of audits conducted
  - Describe audit findings
  - Provide descriptions of required corrective actions
  - Record status of each corrective action on an ongoing basis
  - Track each finding and corrective action to closure
- Generates findings and corrective actions log that maintains the total number of open and closed findings

Audit Findings Worksheet

Project ABC Audit Findings and Corrective Actions

Report Date: 01/25/07

Total Findings Open: 1

Total Findings Closed: 3

Rec #	Audit Date	Process or Product Audit	Finding Description	Corrective Action (CA) Description	Assignee	Planned CA Due Date	Re-Assess-ment Date	Date Closed	Status
1	01/13/06	CM Plan	The CM Plan did not follow the designated template. Several sections (e.g., configuration audits, status accounting) were omitted	Revise the current CM Plan to adhere to ISD's template and include all required information	John Doe	04/05/06	04/06/06	04/06/06	MM/DD/YY: Status to date
2	05/05/06	SMP	No Findings						
3	06/01/06	RSMK Process	Risks have not been updated or monitored for 5 months. The Risk Management Plan (RMP) states that risks will be statused on a monthly basis	Risk Meetings need to resume on a monthly basis to monitor and status open risks	Jane Doe	07/01/06	08/05/06	08/05/06	08/05/06: Risk meetings were conducted for July and August and the risks have been statused appropriately 07/15/06: A Risk meeting was conducted on July 7th. Note: Consecutive meetings need to occur before this finding can be closed
4	06/01/06	RSKM Process	The project is not using the required 5x5 risk matrix (per the RMP)	Convert the current 3x3 matrix to a 5x5	Jane Doe	07/01/06	07/07/06	07/07/06	07/07/06: The matrix was successfully converted to the standard 5x5 risk cube
5	06/07/06	VDD	The VDD for Release 2.0 did not include all required information per the template	Update the VDD to include the list of Workarounds.	Jane Doe	06/12/06			08/13/06: Release 2.0 has been postponed until September 1st to include a new Severity 1 SPR. 07/01/06: Release 2.0 was held up and will be redelivered 08/10

Basis of Estimate (BOE) Guidance

- Every project should have a documented BOE – the project attributes or parameters used to estimate project costs and the assumptions used in the estimation
- The BOE should account for product and task attributes, environment, design approach, level of complexity, etc.
- The actual estimate can then be prepared using historical data for projects with similar attributes and parameters
- The BOE Guidance provides a template for developing your Basis of Estimate with guidance on completing each document section

BOE Guidance Template Outline

1. Overview
2. Scope
3. Estimate Base Sources
   - 3.1 Design Basis
   - 3.2 Planning Basis
   - 3.3 Cost Basis
     - 3.3.1 Material
     - 3.3.2 Equipment
     - 3.3.3 Labor
     - 3.3.4 Travel
     - 3.3.5 Transportation
     - 3.3.6 Training
     - 3.3.7 Facilities
4. Allowances
5. Assumptions
6. Exclusions
7. Deviations
8. Risks and Opportunities (RO)
9. Contingency Reserves
10. Management Reserve
11. Reconciliation
12. Benchmarking
13. Quality Assurance
14. Estimating Team
15. Attachments
    - 15.1 Documents
    - 15.2 Additional

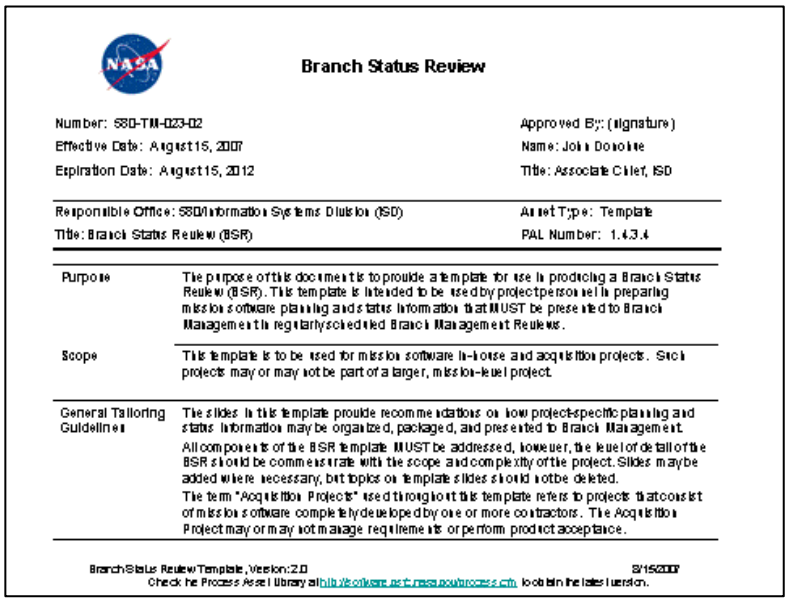
Branch Status Reviews Are a NASA Requirement

- **NPR 7150.2, SWE-018: A project "*shall regularly hold reviews of software activities, status, and results with the project stakeholders and track issues to resolution*".**
- **This includes regular status reviews to management**
- **Status reviews to management are recommended monthly via BSRs**
- **Recommended topics include the following:**
  - **Activities and Accomplishments**
  - **Schedules and Progress**
  - **Measurements**
  - **Risks**
  - **Issues**
- **The BSR Template assists users in putting the BSR together**

**** This tool is located at http://software.gsfc.nasa.gov/AssetsApproved/PA1.4.3.4.ppt**

The Branch Status Review Template

- **The first slides are formatted like other assets**



Branch Status Review

Number: SSD-TM-023-02
Effective Date: August 15, 2007
Expiration Date: August 15, 2012

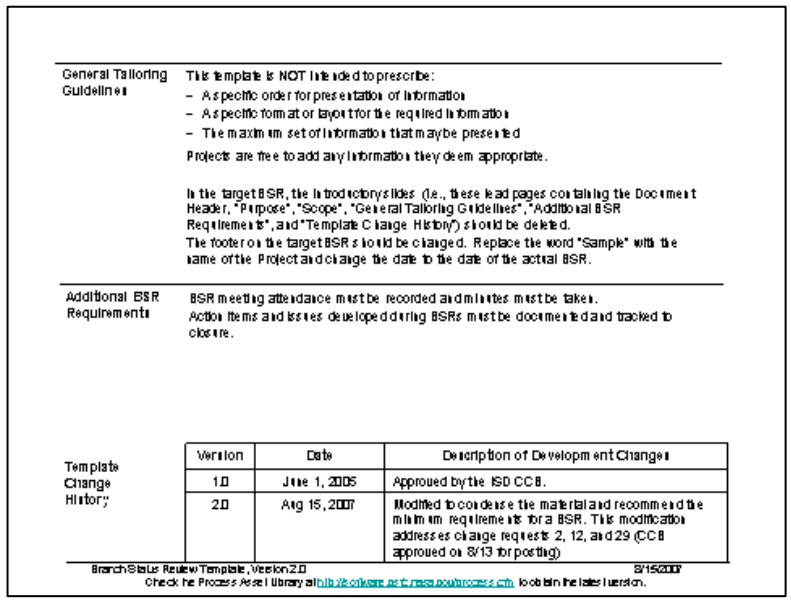
Approved By: (signature)
Name: John Donolue
Title: Associate Chief, ISD

Responsible Office: SSD/Information Systems Division (ISD)
Title: Branch Status Review (BSR)

Asset Type: Template
PAL Number: 1.4.3.4

Purpose	The purpose of this document is to provide a template for use in producing a Branch Status Review (BSR). This template is intended to be used by project personnel in preparing mission software planning and status information that MUST be presented to Branch Management in regularly scheduled Branch Management Reviews.
Scope	This template is to be used for mission software in-house and acquisition projects. Such projects may or may not be part of a larger, mission-level project.
General Tailoring Guidelines	The slides in this template provide recommendations on how project-specific planning and status information may be organized, packaged, and presented to Branch Management. All components of the BSR template MUST be addressed, however, the level of detail of the BSR should be commensurate with the scope and complexity of the project. Slides may be added where necessary, but topics on template slides should not be deleted. The term "Acquisition Projects" used throughout this template refers to projects that consist of mission software completely developed by one or more contractors. The Acquisition Project may or may not manage requirements or perform product acceptance.

Branch Status Review Template, Version: 2.0 8/15/2007
Check the Process Asset Library at http://software.gsfc.nasa.gov/process.cfm to obtain the latest version.



General Tailoring Guidelines	This template is NOT intended to prescribe: – A specific order for presentation of information – A specific format or layout for the required information – The maximum set of information that may be presented Projects are free to add any information they deem appropriate. In the target BSR, the introductory slides (i.e., these lead pages containing the Document Header, "Purpose", "Scope", "General Tailoring Guidelines", "Additional BSR Requirements", and "Template Change History") should be deleted. The footer on the target BSR should be changed. Replace the word "Sample" with the name of the Project and change the date to the date of the actual BSR.
Additional BSR Requirements	BSR meeting attendance must be recorded and minutes must be taken. Action items and issues developed during BSRs must be documented and tracked to closure.

Template Change History:

Version	Date	Description of Development Changes
1.0	June 1, 2005	Approved by the ISD CCB.
2.0	Aug 15, 2007	Modified to condense the material and recommend the minimum requirements for a BSR. This modification addresses change requests 2, 12, and 29 (CCB approved on 8/13 for posting)

Branch Status Review Template, Version: 2.0 8/15/2007
Check the Process Asset Library at http://software.gsfc.nasa.gov/process.cfm to obtain the latest version.

- **The remaining slides include instructions and samples of what the BSR slide would look like for each of the BSR topics**

Example of BSR Instructions and Sample

Issues

- **Provide a brief description of each issue for the purposes of:**
  - Bringing them to management's attention
  - Obtaining management direction
  - Soliciting management's assistance in resolving
- **Minimum Requirements:**
  - Slide(s) must address the project's technical, management, and/or process is
    must include at least:
    - Issue: Clear, concise statement of the problem or concern
    - Analysis: An analysis of the issue including specific internal and externa
      groups/personnel that may be affected or need to be involved in resolvin
      issue
    - Impact: Specific, quantifiable impact(s) on your project
    - Action Plan: Action(s) that are planned and dates the actions are to be co
    - Status: Current progress against the action plan including actual comple
      date(s)
  - Acquisition Projects: Address government issues.
- **Preferred method of presentation:**
  - Use any format that can fully describe the required items

Sample Project Status Review 2/4/2008

Instructions describe what to do …

Example: Issues Slide

Sample Project Issues Log As of: 09/15/06

Issue	Analysis / Impact	Action Plan	Status
CM procedures document has been stalled for months	An early draft of this document was written, but no progress on it has been accomplished in the last few months. Impact: Teams will be unable to consistently and correctly apply CM procedures without this document.	PDL will ask the Branch for some of Suzie's time to finish this document. Action Due Date: 10/01/06	DS/06: New issue this month.
Hard Disk Recorder Implementation: New architecture makes old SRR requirements obsolete.	SW from three groups (GSFC, BAE, GIO) has to interface to make this system work. Impact: Detailed Reqts must go into the new contract SOW.	Convince project to delay the SOW until SW requirements can be refined.	DS/06: SOW has been released with high-level SW requirements. Development of detailed Reqts Docs part of the contract. This issue can be closed. DS/06: New issue this month.
Subsystem 1 Development Team is understated.	Start-up of Subsystem 1 has not been accomplished as planned. Will need to staff with very experienced personnel to minimize impact. Impact: Planned Build 1 contents or schedule are in jeopardy	Work with Branch management to identify experienced personnel. Action Due Date: 09/01/06	DS/06: Davey Jones joined the team this month. This issue is now closed. 07/06: Created new plan. Build 1 date has not slipped; however the contents of the build have been adjusted. Issue will remain open until staff is added.

Sample Only

This sample uses the format in the Issues Tracking Tool (http://software.gsfc.nasa.gov/tools.cfm), however, any format that can fully describe the required items is acceptable.

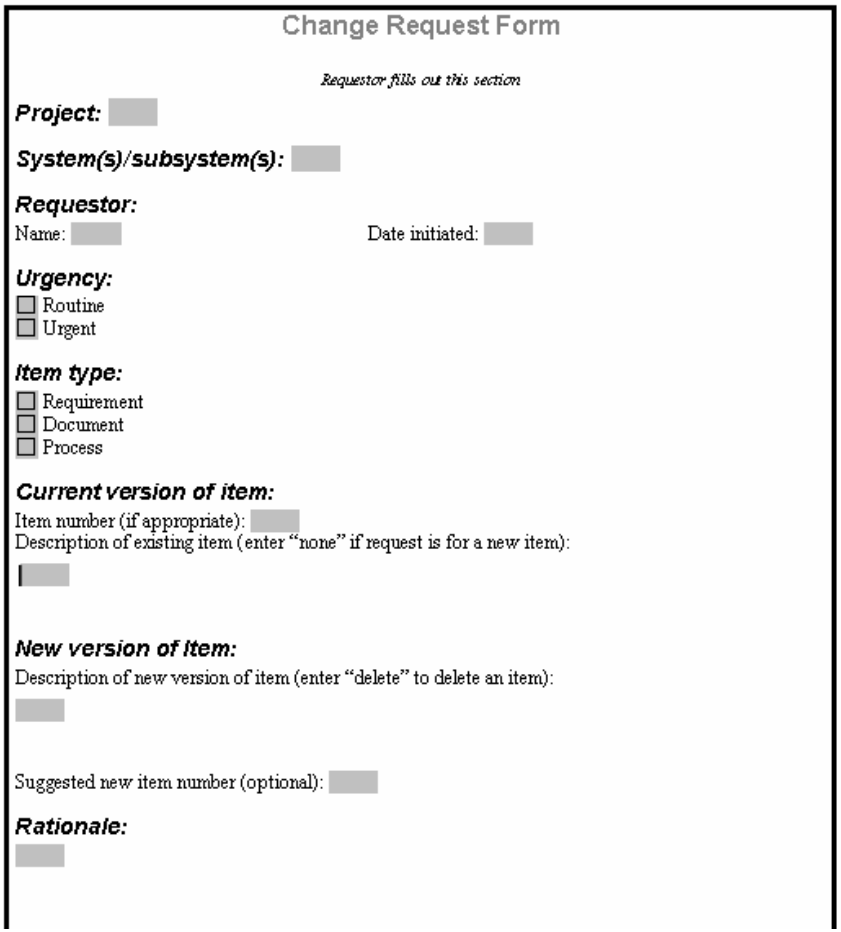
Sample Project Status Review 2/4/2008 page 22

… and the sample shows you what it should look like

Change Request Form and Log

- It provides a form for the submission of change requests
- It provides a second form for recording the change request disposition as it goes through the Configuration Control Board (CCB)
- There is also a log for recording the disposition summary of all change requests received to date

Change Request Form



Change Request Form

Requestor fills out this section

Project:

System(s)/subsystem(s):

Requestor:

Name: Date initiated:

Urgency:

- ☐ Routine
- ☐ Urgent

Item type:

- ☐ Requirement
- ☐ Document
- ☐ Process

Current version of item:

Item number (if appropriate):

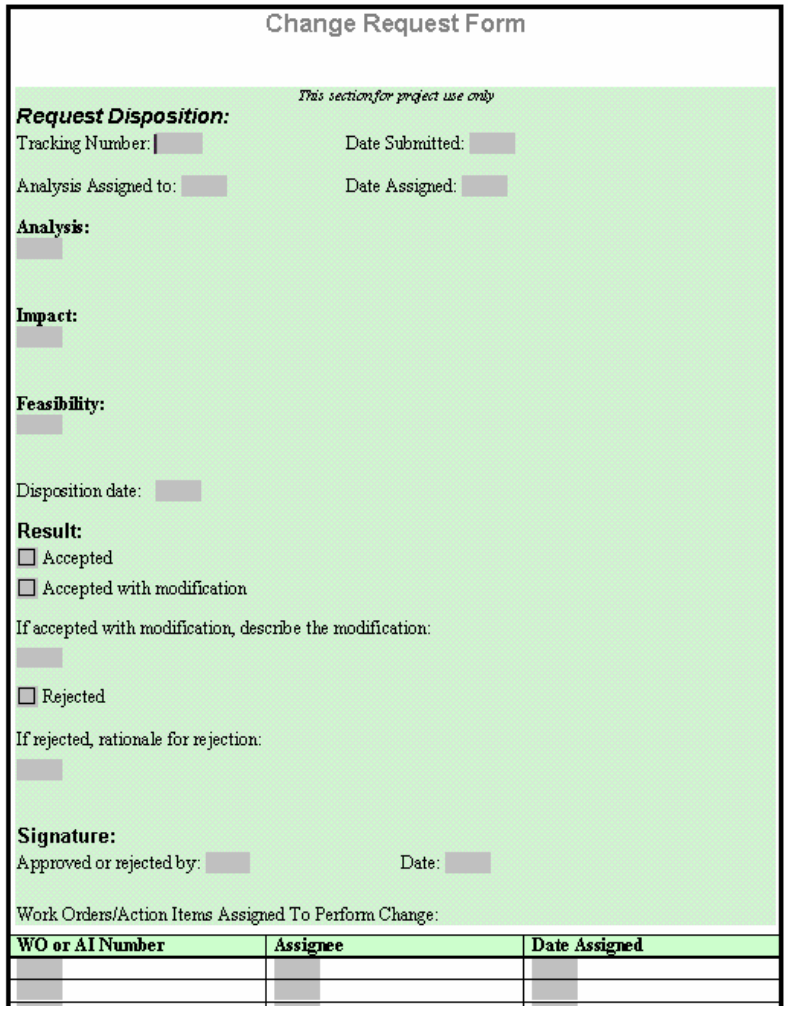
Description of existing item (enter "none" if request is for a new item):

New version of item:

Description of new version of item (enter "delete" to delete an item):

Suggested new item number (optional):

Rationale:



Change Request Form

This section for project use only

Request Disposition:

Tracking Number: Date Submitted:

Analysis Assigned to: Date Assigned:

Analysis:

Impact:

Feasibility:

Disposition date:

Result:

- ☐ Accepted
- ☐ Accepted with modification

If accepted with modification, describe the modification:

- ☐ Rejected

If rejected, rationale for rejection:

Signature:

Approved or rejected by: Date:

Work Orders/Action Items Assigned To Perform Change:

WO or AI Number	Assignee	Date Assigned

Change Request Log

Change Request Log

Project Name:

Tracking Number	Item Type	Systems/Subsystems	Short Description of Change	Urgency	Requestor	Date Submitted	Analysis Assigned To:	Result	WO & AI #'s	Signature Date
		Project:								

CM Baselines Template

- Allows the user to identify applicable baselines and baseline contents
  - Initial list of items in each baseline is documented in the Product Plan
  - The baseline table is maintained outside of the plan
- Records the baseline date and the baseline versions for each configured item
  - When the baseline is created
  - The version number of configured items in the baseline

Example CM Baselines Tool

Planned Baselines

Items	Org.	Concept	Requirements	Design	Implementation	System Testing	Acceptance Testing	Operations
Date of baseline:		3/1/07	6/1/07					
SMP/PP	P	V1.1	V1.1					
Configuration Management Plan	P	V1.0	V1.2					
Test Plan	P	V0.1	V0.5					
Software Requirements Document	P		V1.0	•				
Simulator Design	P			•	•	•	•	•
Simulator models	P			•	•	•	•	•
Simulator Software	P			•	•	•	•	•

Date of the Baseline

Items in the Baselines

Date or version of configured items in the Baselines

Items planned for future Baselines

Data Management Tool

- **What is Data Management?**
  - **It is the collection, organization, and storage of data, information, documents, etc., related to project products and to project processes**
  - **It defines the "filing system" for all of the "stuff" the project creates, and specifies the level of control**
- **What does the tool do?**
  - **It provides a standard template for a list of the materials generated by a software project**
  - **It indicates storage location, how items are controlled, and who controls them**
  - **It includes monitoring fields and a monitoring log to help ensure the expected data items are being collected**
  - **It should be customized for each project**

Data Management Worksheets

Data Management List (DML)

Title (must add links to the documents in the delivered PAL)	Description / Notes	Created by/ Responsible for update	Level of Control	Location (Project name]/Folder below OR Server OR URLs	Primary Process Area	Frequency of update/creation	Current Version Number	Current Version Date	ITAR Sensitive?	PPQA Evaluation Required?	FY 2007 (sample entries/checks for 1st Quarter 1	Quarter 2	Quarter 3	Quarter 4
Data Management List (DML) (this list)	This is important to Planning, Monitoring and Control and CM	PDL	Version	02 Project Management	PP	As needed			N		✓			
CM/DM Plan	See Product Plan section x.x *(or this could be a separate plan)*	CM Lead	CCB	05 CM Materials	PP	Annual			Y	Yes		✓		
Project Plan		PDL	CCB	02 Project Management	PP	Annual			Y	Yes		✓		
Acquisition Management Plan	See Product Plan section x.x *(or this could be a separate plan)*	PDL	CCB	02 Project Management	PP	Annual			Y	Yes		✓		
Schedule	Schedule, notes and inputs to schedule in the form of redlines/emails	PDL	Version	02 Project Management	PP	Monthly			N		✓		✓	
Estimates with Basis of Estimates	Includes software and workproduct size estimates, effort estimates, staffing, schedule estimates and basis for all	PDL	Version	02 Project M	PP	As			N					

Data Management Monitoring Log

Instructions for Use: Enter observations regarding expected data vs. what is found. Ensure items are in correct locations in repository, items expected are present, and that items not expected are either added to the data management list or are removed from the repository. At a minimum, some data items should be reviewed quarterly, and all items should be reviewed at least annually.

Date	Name	Data Management Monitoring Log
10/2/2006	*Casto*	*Reviewed contents of "02 Project Management" folder. ABC development team status reports missing. Carly Simon has found them and placed them in the folder.*
6/1/2006	*Page*	*Reviewed meeting minutes folder -- "05 Meeting Minutes". No problems found.*

Inspection Metrics Tool

- An Excel-based tool used to store, analyze and report inspection metrics
- The Status Data worksheet contains a row of summary metrics from each inspection
  - Designed to receive data produced by the Inspection Moderator's Tool in each row
- An option to this tool is to put the data into the Status Data worksheet for incorporation into status reporting charts

Inspection Metrics Tool Example

To use, insert the data as indicated in the user's guide (worksheet 1) and complete the analysis of inspection status across the project.

# Planned Meetings	
# Actual Meetings	

						Defects				Action Items	
Item Inspected	Author	Review Date	Total Effort	Meeting Length	Number Attendees	Number Found	Number Corrected	Number Deferred	Inspection Type	Open Actions	Closed Actions

Analysis: [fill in]
Impact: [fill in]
Corrective Action: [fill in]

Inspection Moderator's Tool

- An Excel-based tool used by inspection moderators to record:
  - Meeting attendance
  - Defects identified by the inspection
  - Key metrics
- Includes worksheets for multiple inspection types:
  - Requirements
  - Unit design or code
  - Test plans
- Automatically produces metrics for the inspection metrics tool or status reporting charts

Using the Inspection Moderator's Tool

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PREPARATION			
Item inspected:			
Author:			
Inspection type:	Design/Code		
Review Date			
Meeting Time:			
Total Prep. time	0		
Name	Role / Stakeholder affiliation	Prep hours	Attended?
	Moderator		
	Author		
	Reviewer		

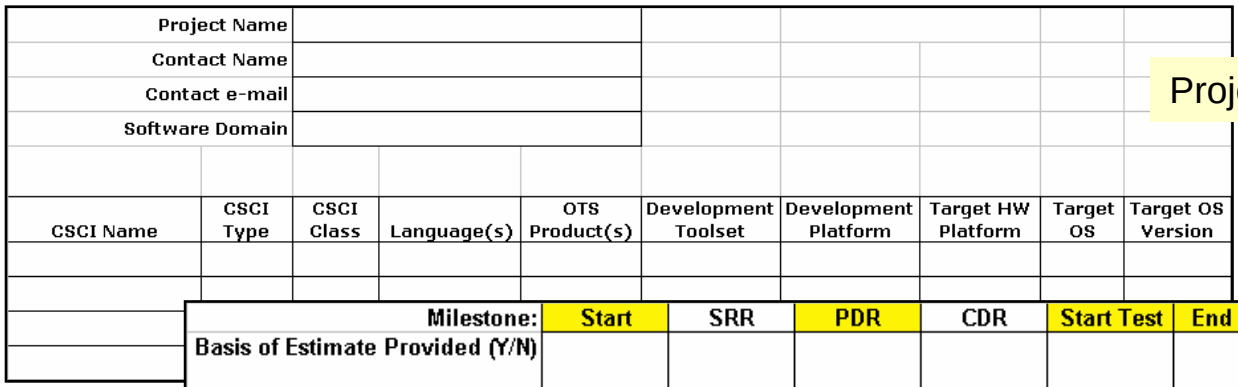
MEETING				
ID	Defect Description	Disposition	Defect Severity	Defect Type
	Total # of defects	0		
	Meeting Length:			
	Number of attendees:	0		
	Meeting effort	0		

POST-MEETING		
	Author effort to correct defects	
	Moderator effort to review corrections	
	Total post-inspection effort	0
	Outcome (pass or re-inspect)	

Measurement Summary Tool

- Provides a standard template for the collection of organization level measures from software projects
- Provides worksheets for:
  - Software characteristics
  - Software size estimates
  - Milestone data
  - Additional notes about a project

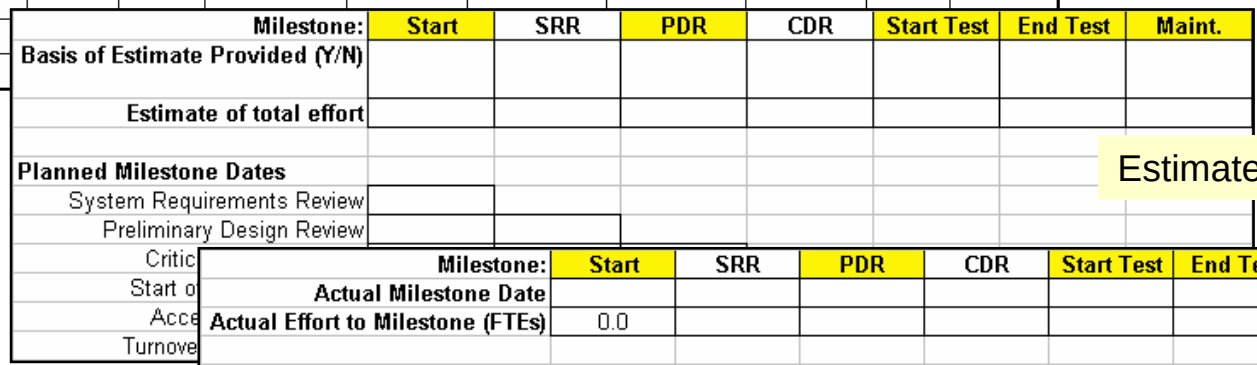
Measurement Summary Tool Worksheets



Project Name	
Contact Name	
Contact e-mail	
Software Domain	

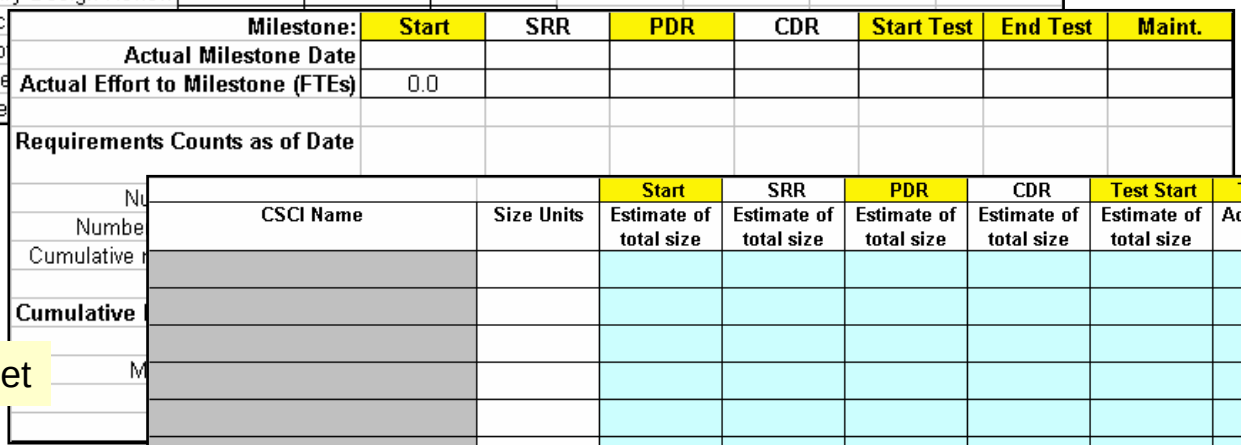
CSCI Name	CSCI Type	CSCI Class	Language(s)	OTS Product(s)	Development Toolset	Development Platform	Target HW Platform	Target OS	Target OS Version

Project Characteristics Sheet



Milestone:	Start	SRR	PDR	CDR	Start Test	End Test	Maint.
Basis of Estimate Provided (Y/N)							
Estimate of total effort							
Planned Milestone Dates							
System Requirements Review							
Preliminary Design Review							

Estimates & Plans Sheet



Milestone:	Start	SRR	PDR	CDR	Start Test	End Test	Maint.
Actual Milestone Date							
Actual Effort to Milestone (FTEs)	0.0						
Requirements Counts as of Date							

Actuals Sheet

CSCI Name	Size Units	Start Estimate of total size	SRR Estimate of total size	PDR Estimate of total size	CDR Estimate of total size	Test Start Estimate of total size	Test End Actual Size	Maint Actual Size

CSCI Size Data Sheet

Meeting Minutes Template

- Used to create meeting minutes
- Provides guidance within the template
- Can be easily modified to meet specific needs
- It records the
  - Agenda
  - List of attendees
  - Decisions made
  - Action item review
  - Meeting discussion points

Example Meeting Minutes

Task Status Meeting Minutes
Project ABC
January 5, 2007, Bldg 23, Room E230

Agenda:

BSR Overview Section (PDL) (10 minutes)
BSR Development Section (DTL) (10 minutes)
BSR Test Section (TTL) (10 minutes)
BSR Wrap-up Section (PDL) (5 minutes)
Action Item Review (10 minutes)
Other business (as required)

Items to read prior to the meeting: None
Items to bring to the meeting: Action item status for all current action items

Attendees:

Name	Role/Responsibility	Required	Present
Paula Abdul	Branch Head	X	X
Marvin Gaye	Product Development Lead (PDL)	X	X
Billy Joel	Development Team Lead (DTL)	X	X
Harry Commack, Jr.	Development Team Member	X	X
Sheryl Crow	Test Team Lead (TTL)	X	X
Kelly Clarkson	Test Team Member		X

Discussion
All sections of the BSR Package were presented and reviewed per the agenda. Two new action items were assigned as noted in the Action Item Review Section

Decisions:
During the meeting it was decided that the two staffing slides in the BSR template would be condensed into one slide the same information was conveyed in two different formats.

Action Item Review:
All 16 existing action items were reviewed. There were 8 action items closed: #71, 68, 67, 66, 58, 48, 44, 35. There were 2 new action items were assigned during the meeting:

#	Assignee	Action	Priority	Due Date
74		Issue: Kelly Clarkson could be much more useful to the test team if she could access the test tool via VPN from offsite. Action: look into getting a VPN account and software for Janet.	2	10/13/06
75		Issue: Test Team Progress Tracking chart (p20, 21): (1) baseline should track reductions or additions to total points, (2) data table at bottom of chart doesn't show anything useful. Action: update baseline, delete data table (but add legend to identify lines) - see p12 in this package for example.	2	10/13/06

The action item log may be found at <*provide the location of the action log*> for current status and action details.

Other Business:

It was announced that a special training class will be held on the new CM Tool next week. Those who will use the tool should be told to attend.

Point Counting Spreadsheets

- **Support the monitoring of work packages that:**
  - **Have a moderate number of known tasks**
  - **Have task dependencies which are not a serious source of risk**
- **Can display trend information to provide insight into progress including the ability to meet schedules**
- **A User Guide is also provided**

NOTE:

Point counting is discussed in the Quantitative Software Management (QSM) course; refer to QSM course session 'Part 4, page 30 - Progress and Schedule' at: http://software.gsfc.nasa.gov/QSMindex.html

Point Counting will also be discussed in a future Engineering Discussion

Planning and Monitoring Examples

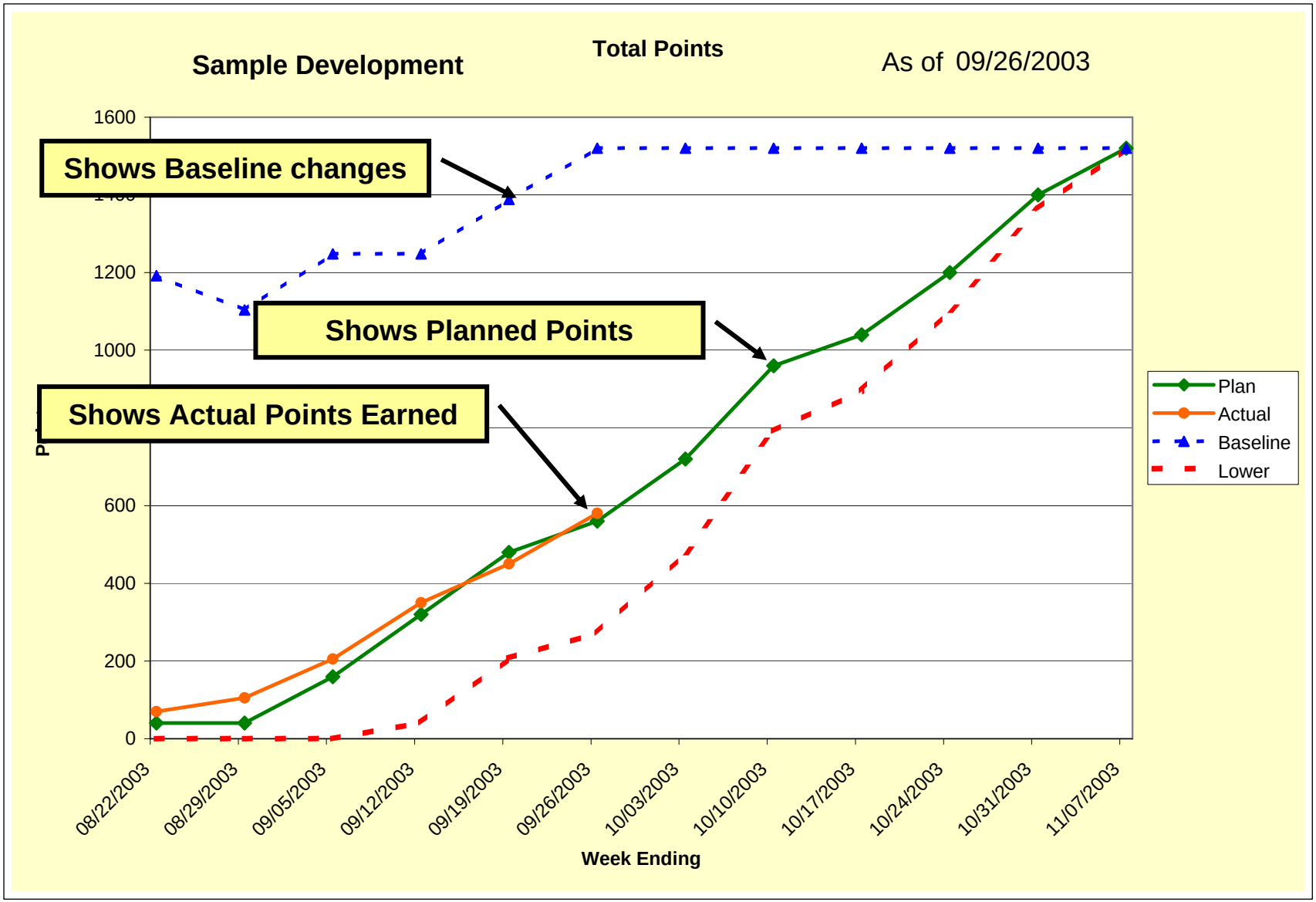
As of	05/04/03	Enter the date for which the actuals are to be accumulated (date of status)											
Start date	05/04/03												
	Points	Planned	DoW	Actual	5/11	5/18	5/25	6/1	6/8	6/15	6/22	6/29	
Activity-001	1	5/7	Wed	*	due								
Activity-002	1	5/9	Fri	*	due								
Activity-003	1	5/9	Fri	*	due								
Activity-004	1	5/14	Wed	*		due							
Activity-005	1	5/16	Fri	*		due							
Activity-006	1	5/16	Fri	*		due							
Activity-007	1	5/21	Wed	*			due						
Activity-008	1	5/23	Fri	*			due						
Activity-009	1	5/23	Fri	*			due						
Activity-010	1	5/28	Wed	*				due					
Activity-011	1	5/30	Fri	*				due					
Activity-012	1	5/30	Fri	*				due					
Activity-013	1	6/4	Wed	*					due				
Activity-014	1	6/6	Fri	*					due				
Activity-015	1	6/6	Fri	*					due				
Activity-016	1	6/11	Wed	*						due			
Insert on this row		*	*	*									
				Plan	3.0	6.0	9.0	12.0	15.0	16.0	16.0	16.0	
	16			Actual	0.0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.0

The plan for 16 activities

Tracking progress of the 16 activities

As of	05/18/03	Enter the date for which the actuals are to be accumulated (date of status)												
Start date	05/04/03													
	Points	Planned	DoW	Actual	5/11	5/18	5/25	6/1	6/8	6/15	6/22	6/29		
Activity-001	1	5/7	Wed	5/8	1.0								1.0	
Activity-002	1	5/9	Fri	5/15	due	1.0							1.0	
Activity-003	1	5/9	Fri	5/12	due	1.0							1.0	
Activity-004	1	5/14	Wed	5/12		1.0							1.0	
Activity-005	1	5/16	Fri	5/14		1.0							1.0	
Activity-006	1	5/16	Fri	*		due							late	
Activity-007	1	5/21	Wed	*			due							
Activity-008	1	5/23	Fri	*			due							
Activity-009	1	5/23	Fri	*			due							
Activity-010	1	5/28	Wed	*				due						
Activity-011	1	5/30	Fri	*				due						
Activity-012	1	5/30	Fri	*				due						
Activity-013	1	6/4	Wed	*					due					
Activity-014	1	6/6	Fri	*					due					
Activity-015	1	6/6	Fri	*					due					
Activity-016	1	6/11	Wed	*						due				
Insert on this row		*	*	*										
				Plan	3.0	6.0	9.0	12.0	15.0	16.0	16.0	16.0		
	16			Actual	1.0	5.0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	5.0	

Point Counting Trend Chart Available



Problem Report Tool

- An Excel-based tool to manage problem reports and generate related metrics analyses
- Targeted to small projects that may not have a larger, more complex, or expensive tool
- Tool provides information stored for each problem and summary metrics to assess overall software quality
- A user's guide is found in the first tab of the spreadsheet

Problem Report Tool – User Input

Enter the Project information on the first spreadsheet

Project Name:	Project X	
Start Date:		
End Date:		

For identified problems, enter the initial problem description information on the second spreadsheet

Project X						
ID	Title	CSCI	Affected SW Items	Problem Description	Originator	Corrective action/ analysis

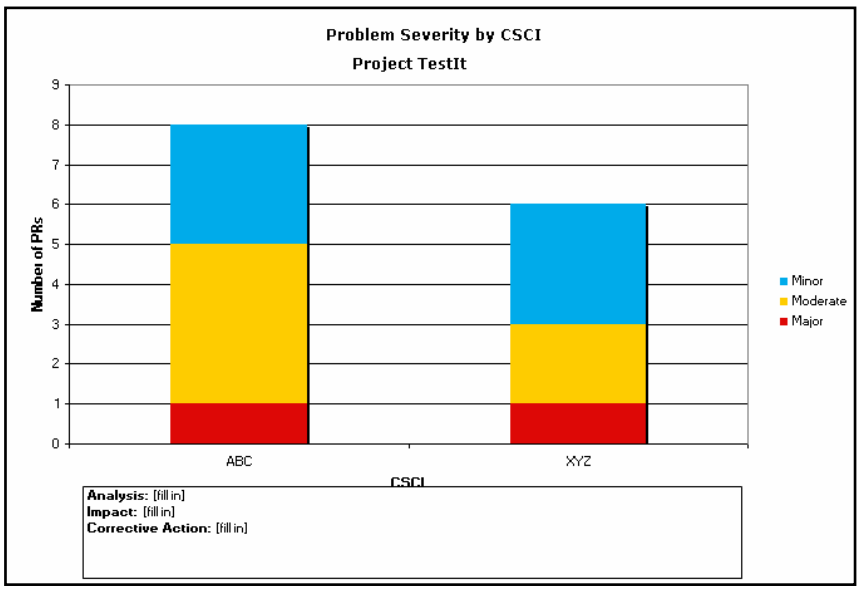
Then add to the spreadsheet as actions are assigned and tracked to closure

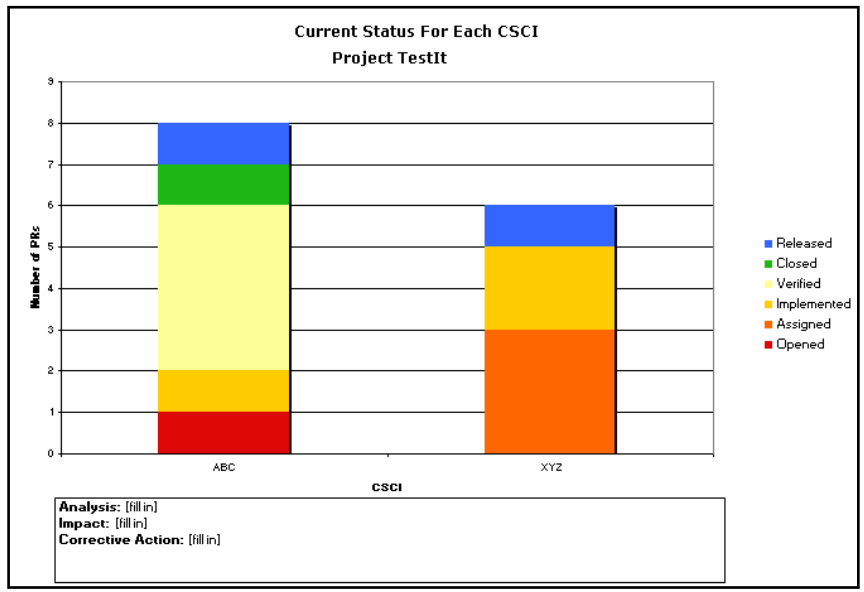
Severity	Priority	Date Opened	Assigned to	Status	Approved By:	Date Approved	Phase Introduced	Phase Identified	Rework Effort

Problem Report Tool – Metric Output

Assess available metrics for problem report status overall. Shown are just three of the available reports.

CSCI Name	Opened	Assigned	Implemented	Verified	Closed	Released	Withdrawn	Major	Moderate	Minor	Submitted	Accepted	Completed
ABC	1	0	1	4	1	1	0	1	4	3	8	8	2
XYZ	0	3	2	0	0	1	0	1	2	3	6	6	1
Total # PRs in each state	1	3	3	4	1	2	0	2	6	6	14	14	3





Repository (web-based)

- Facilitates a web-based filing system / directory structure for the materials generated by a project
- Use is limited to GSFC personnel and hosting is free through Code 585
- Each project receives its own instance of the tool which is password secured
- This tool is hosted on a Code 585 internal server. To obtain access, contact Chris Durachka

Requirements Traceability Tool

- Allows the user to collect all requirements in a single repository
- Allows the user to map requirements to design elements, code elements, and test procedures
- Provides the bi-directional traceability required by CMMI
- Allows users to:
  - Print a requirements report
  - Determine what requirements are “TBD”, allocated to a CSCI Build, or allocated to a Unit or Module
  - Determine what Build test procedures test a given requirement or the list of requirements tested by a specific test procedure
  - Determine what System test procedures test a given requirement or the list of requirements tested by a specific test procedure

Requirements Matrix Spreadsheet

Requirements Matrix for Project ABC

Sort Field	Requirement Identifier	Requirement text	Requirement Source	Requirement State	CSCI	CSCI Build Number	Module or Unit	Build Test Procedure	System Test Procedure
1	F3308	The ABC software shall initialize itself following a Cold Restart of the main processor.	MRD 3.22	Have all info	ABC	1	Unit 1	ABC B1-8	ABC ST-2
2	F3309	On cold restart, the software shall initialize all ABC data segments, causing all variables to be zeroed or reset to their preset values stored in EEPROM.	CR 15	Req deleted					
3	F3310	The software shall reset all ABC database-specifiable parameters to their preset values stored in EEPROM.	MRD 3.23	Have all info	ABC	1	Unit 1	ABC B1-2	ABC ST-1
4	F3311	The software shall set all ABC telemetry and command output packet buffers to zero.	MRD 3.24	Have all info	ABC	1	Unit 1	ABC B1-3	ABC ST-3
5	F3312	On cold restart, the ABC software shall enter Sun Acquisition Mode.	MRD 3.25	Have all info	XYZ	1	Unit 12	XYZ B1-4	XYZ ST-2
6	F3313	On cold restart, the ABC software shall initialize ABC unique parameters as appropriate to ensure that each ABC software process starts from a known state.	CR 23	CR Submitted	ABC	2	Unit 2	ABC B2-1	ABC ST-2
7	F3314	The ABC software shall set all ABC statistics and the statistics reset counter to zero.	MRD 3.26	Have all info	ABC	2	Unit 2	ABC B2-2	ABC ST-1
8	F3323	The ABC software shall initialize prior solutions for all sensor and actuator data proces results.	MRD 3.27	Have all info	XYZ	1	Unit 13	XYZ B1-1	XYZ ST-4
9	F3324	The ABC software shall set the "CSS flag.							
10	F3325	The ABC software shall flag the prior spacecraft pointing error solutions as							
11	F3315	The ABC software shall set the SA de status (complete/incomplete) to a dat specified value.							

All requirements (for all CSCIs and all builds) …

can be filtered. Below the list is filtered on a single CSCI build – ABC Build 3.

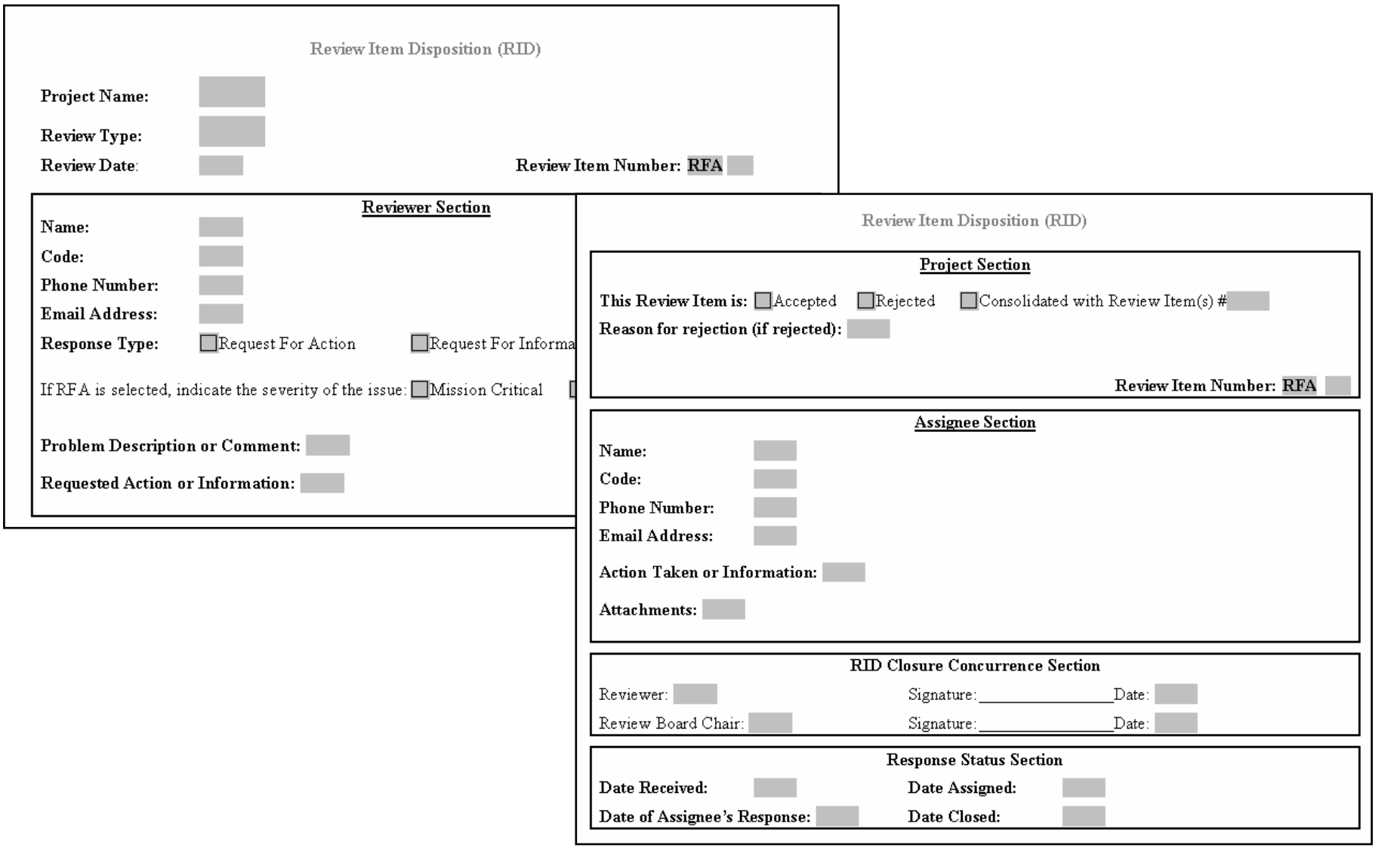
Requirements Matrix for Project ABC

Sort Field	Requirement Identifier	Requirement text	Requirement Source	Requirement State	CSCI	CSCI Build Number	Module or Unit	Build Test Procedure	System Test Procedure
66	F3373	If the differences in transformed CSS measurements for matched CSS pairs do not exceed the "sun detection" threshold for at least two CSS pairs, the ABC software shall a. flag the CSS data for that DFE as invalid b. notify FDC (if enabled) c. retain the prior CSS sun direction vector and "in eclipse" flag setting for that ACE:	MRD 3.02	Have all info	ABC	3	Unit 5	ABC B3-1	ABC ST-9
95	F3401	On receipt of command, the ABC software shall select the ST to be used as primary.	MRD 3.09	Need info	ABC	3	Unit 8	ABC B3-2	ABC ST-16
96	F3402	The ABC software shall validate ST data.	MRD 3.22	Have all info	ABC	3	Unit 8	ABC B3-2	ABC ST-16
97	F3403	If an ST packet is not received, the ABC software shall, for that ST, a. flag the data as invalid b. retain the prior ST attitude solution and rate	MRD 3.27	Need info	ABC	3	Unit 7	ABC B3-5	ABC ST-16
100	F3406	If the angular change between the previous and current ST-estimated attitudes differ by more than a "maximum ST angular change" limit, the ABC software shall, for that ST, a. flag the data as invalid b. notify FDC (if enabled) c. retain the prior ST attitude solution and rate	MRD 3.06	Have all info	ABC	3	Unit 6	ABC B3-2	ABC ST-2

Review Item Disposition (RID) Form

- The RID form is generic and applicable to any project
- It provides sections for the reviewer to record comments or problems identified
- The form also provides sections to track the disposition
  - Project response section
  - Assignee response section
  - Closure and status sections

RID Form



Review Item Disposition (RID)

Project Name:

Review Type:

Review Date:

Review Item Number: RFA

Reviewer Section

Name:

Code:

Phone Number:

Email Address:

Response Type: Request For Action Request For Informa

If RFA is selected, indicate the severity of the issue: Mission Critical

Problem Description or Comment:

Requested Action or Information:

Review Item Disposition (RID)

Project Section

This Review Item is: Accepted Rejected Consolidated with Review Item(s) #

Reason for rejection (if rejected):

Review Item Number: RFA

Assignee Section

Name:

Code:

Phone Number:

Email Address:

Action Taken or Information:

Attachments:

RID Closure Concurrence Section

Reviewer: Signature:_____Date:

Review Board Chair: Signature:_____Date:

Response Status Section

Date Received: **Date Assigned:**

Date of Assignee's Response: **Date Closed:**

Risk Management Tool

- Allows you to enter up to 30 risks with the following fields:
  - Risk ID and Title
  - Risk Condition, Consequence, Context, and Status
  - Originator and Date Identified
  - Assignee
  - Probability of Occurrence, Impact, Timeframe, and Trend
  - Current State
  - Risk Rank, Risk Source, and Risk Category
  - Visibility
  - Date Last Reviewed and Date Last Modified
  - Mitigation Plan
- Calculates the Exposure
- Provides summary page with NASA Cube

Risk Tool Worksheets

Risk ID:	1	**My First Risk 1**	**State:**	Watch
Identified:	01/01/07	**Y**	**Rank:**	1
Originator:	Page	**(Exposure (calculated)) ▲**	**Source:**	Tech
Assigned To:	Donna		**Category:**	Mgmt
Probability:	Medium		**Visibility:**	Internal
Impact:	High	**Trend ▼**	**Reviewed:**	01/25/07
Timeframe:	1-3 mo	**Unchanged**	**Modified:**	<Date>
	Condition:	Because of the complexity of the varied instrument interfaces to be accomodated		
	Consequence:	The team could miss some specific interface details, causing problems during interface testing.		
	Context:	The mission includes three instruments and one tech demo experiment. Because each instrument has heritage, there are seven unique interface protocols to deal with in the xyz software. While each protocol is fairly simple by itself, considered all together, the combination is very complicated.		
	Status:			
		July 2006 - All ICDs were approved.		
		June 2006 - The Instrument Manager code is being prototyped in Build 2. Interface tests with instrument breadboards/ETUs will begin in September.		

Assigned To	Step Number	Mitigation Step Description / Status	Planned	Actual
<name>	1	Description of Step 1	<date>	<date>
<name>	2	Description of Step 2	<date>	<date>
<name>	3	Description of Step 3	<date>	<date>
<name>	4	Description of Step 4	<date>	<date>

Each risk is entered and updated regularly …

and the summary is provided automatically.

Project: ABC **Report Date: 01/01/06**

Trend
I = Improving
W = Worsening
U = Unchanged
N = New

Probability \ Impact	VL	L	M	H	VH
VH	0	0	0	0	0
H	0	0	0	0	1
M	1	0	0	1	0
L	0	0	1	0	0
VL	0	0	0	0	0

Exposure	New	Modified	Retired	Open
R	0	0	0	1
Y	0	0	0	1
G	2	0	0	2
Totals	2	0	0	4

Risk ID	Rank	Trend	Risk Title	Assigned To	Exposure	Timeframe	State	Identified	Reviewed
1	1	U	My First Risk 1	Donna	Y	1-3 mo	Watch	01/01/07	01/25/07
2	1	N	My Second Risk	Bob	G	1-3 mo	Watch	01/02/07	01/10/07
3	1	W	My Third Risk	Mark	R	<1 mo	Mitigate	01/03/07	01/20/07
4	1	N	Risk 4	Dave	G	> 3 mo	Research	01/04/07	<Date>

Roles and Responsibilities List

- A list of approved project roles and the associated responsibilities to help teams set up roles and responsibilities for a specific project
- To Use the list:
  - Combine roles and responsibilities to create a list of roles that will address all of your project needs
  - Include all appropriate roles or move specific responsibilities into modified role descriptions
  - Cover *process responsibilities* as well as *technical responsibilities*
  - Document roles and responsibilities in the Software Management Plan/Product Plan
  - Use roles for assignment of specific tasks and for developing a Team Training Plan

Project Roles Defined in the List

- Acquisition Manager (AM)
- Configuration Management Officer (CMO)
- Contracting Officer (CO)
- Contracting Officer's Technical Representative (COTR)
- Development Engineer (DE)
- Development Team Lead (DTL)
- Line Manager (MGR)
- Maintenance Engineer (ME)
- Maintenance Team Lead (MTL)
- Product Development Lead (PDL)
- Simulator/Tools Engineer (STE)
- Software Manager (SM)
- Software Quality Engineer (SQE)
- Software Technology Researcher (STR)
- System Engineer (SE)
- Test Engineer (TE)
- Test Team Lead (TTL)

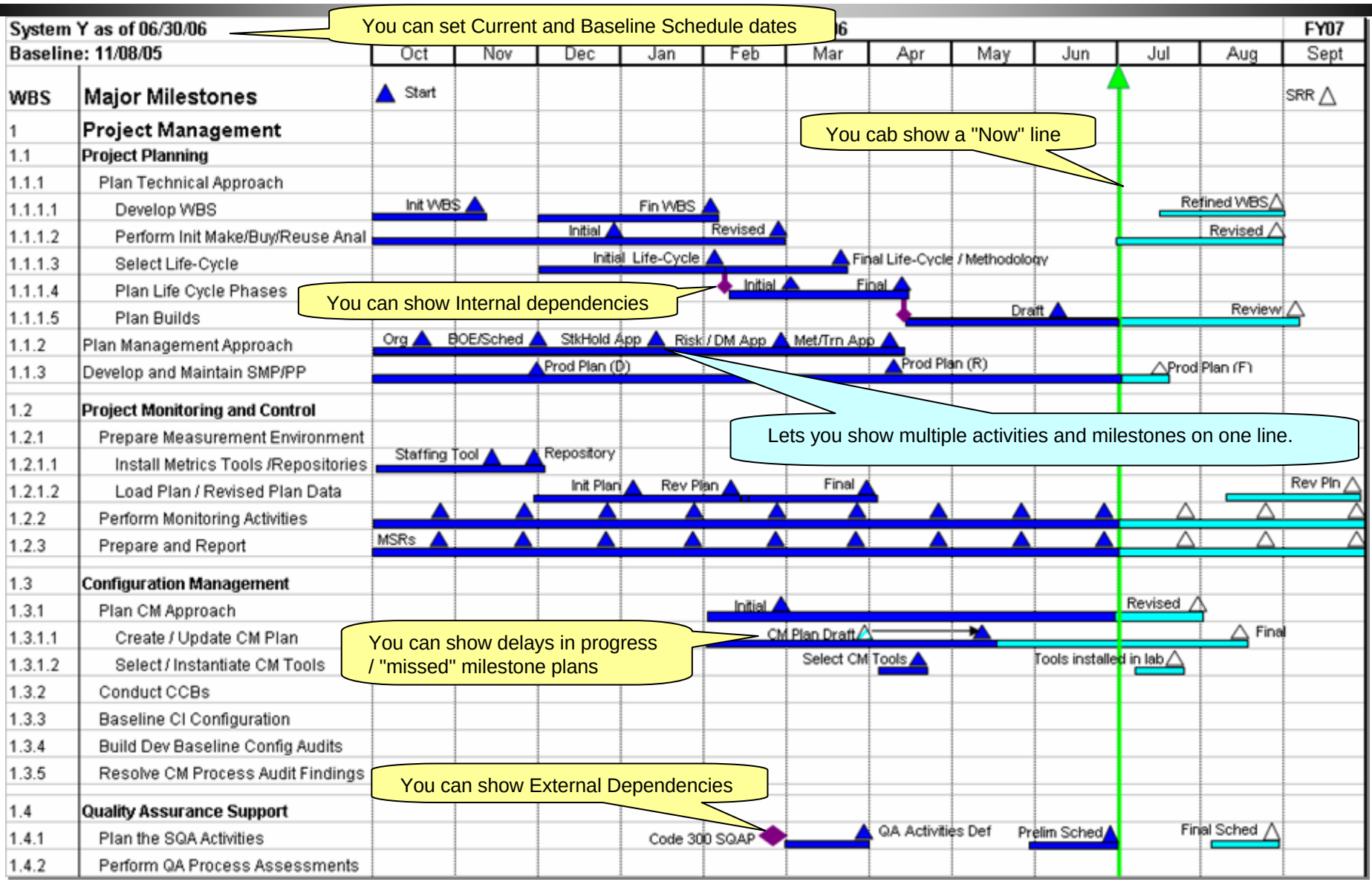
Example Role/Responsibility Description:

Development Engineer (DE)	Responsible for detailed design, implementation, integration, and build-integration testing. Supports requirements engineering.

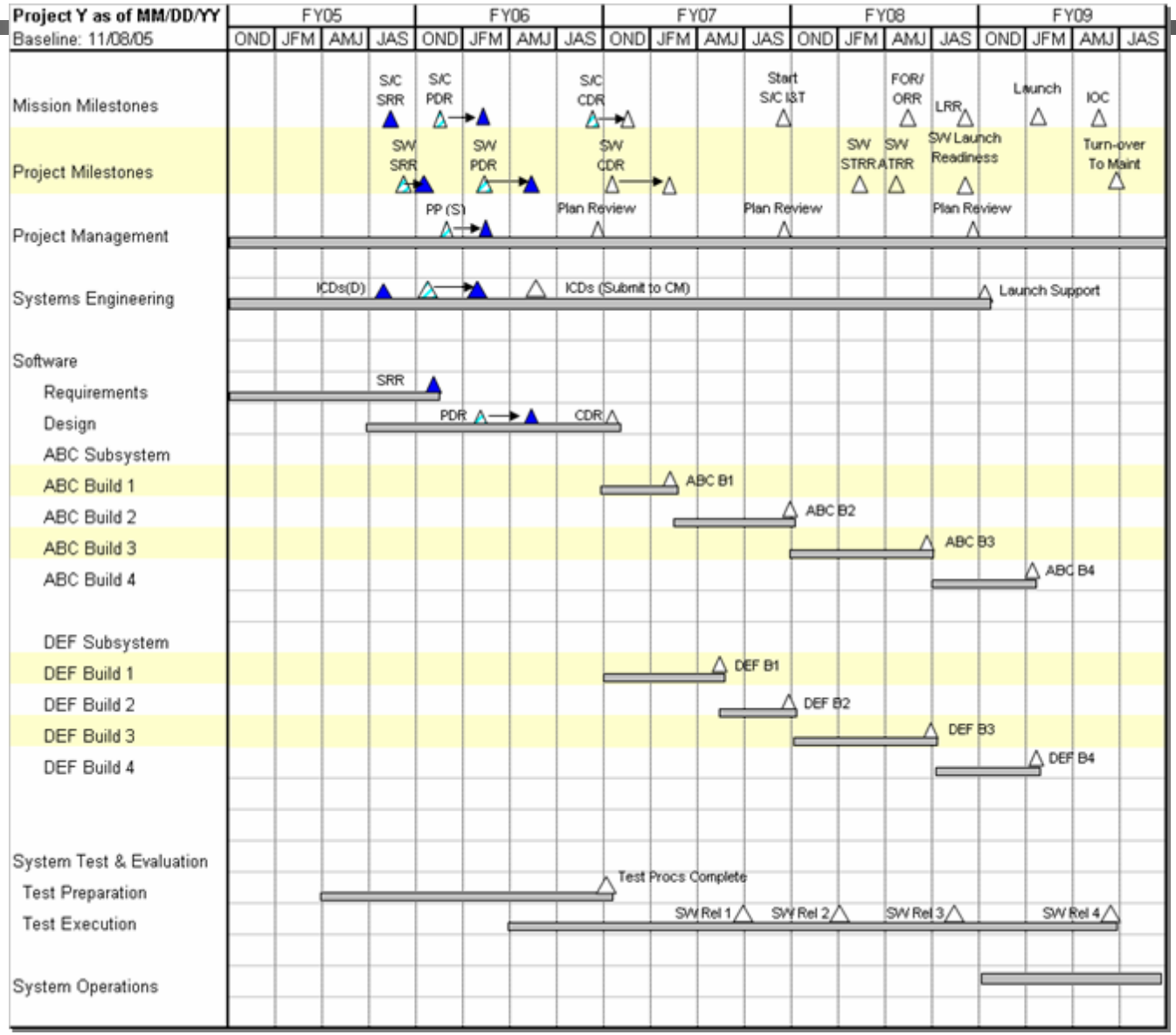
Scheduling Tool

- The tool is based on Excel and provides a free tool for projects that can't afford MSProject or other scheduling tools
- The tool is not automated, but assists the user in drawing the schedule

The Schedule Tool – Detailed Schedule



The Schedule Tool – High Level Schedule



SMP/PP Boilerplate

- The SMP/PP Boilerplate (in Tools area) is different from the SMP/PP Template (in the Process Assets Library area)
- The Boilerplate has appropriate text for over 80% of the document
- To use the boilerplate, follow the embedded instructions and provide the indicated information
- This tool may only be downloaded by government employees
  - It may be used by Contractors if provided by the PDL or other government employee

Examples of Boilerplate Instructions

2.2.1.1 Process for Addressing Customer Requirements Changes

All changes to the baselined requirements, design, or implementation required or requested by the customer, collectively referred to as customer requirements changes, must be provided to the PDL in writing. Electronic forwarding of changes is preferred.

As part of its requirements management process, the PDT will use its configuration control process to evaluate each customer requirement change; determine whether there will be an impact on cost, schedule, or scope of the effort; and estimate the magnitude of the impact. The PDT will promptly forward the results of this evaluation (i.e., the proposed change) to the customer electronically.

Paragraph 1 – Change the last sentence if a different mechanism for receiving changes will be used. If the customer will handle changes through a CCB, briefly describe or refer to the customer's CCB process (it may be in the customer's CM Plan.)

Paragraph 2 –Change the last sentence (after the "by") if a different mechanism for sending change request responses to the customer will be used.

2.2.1.2 Authority for Customer Requirements Changes

The customer will have final authority for approval of changes affecting cost, schedule or scope. The customer must provide written authorization for, or concurrence with, the proposed
writing before the PDT will implement any customer requirements changes. Electro
approval or concurrence is preferred.

Change the last sentence if a different mechanism will be used.

2.2.2 Customer Schedule

Initial planning for this effort is based on the customer's schedule shown in Figure 2
maintained by the customer and is included in this Plan for reference only. The late
schedule may be obtained directly from the customer.

Figure 2.2-1 Customer Schedule

Insert a picture of the high level customer schedule and delete the following table.

2.5 Acceptance Criteria

Customer acceptance of the system will be based on the system meeting the following acceptance criteria:

- All acceptance tests have been formally executed and witnessed by ?????
- All acceptance test results have been peer reviewed and passed
- All critical or urgent problem reports are closed or have customer-accepted work-arounds in place
- ?????

OR

Customer acceptance of the system will be based on the system meeting the acceptance criteria listed in Section ????? of the ????? document.

Select one of the above paragraphs to describe the customer's criteria for determining when the product is completed (i.e., "When will the customer accept the product?"). If the first paragraph is used, list the criteria. Example criteria are provided.

***Note**: The customer's verbal acceptance is **not** sufficient.*

Staffing Tool

- **Supports planning by allowing you to:**
  - **Establish planned staff by name, by month, in Staff months**
  - **Identify portion of each Staff month allocated to listed process areas**
  - **Automatically generate graphs of planned staffing**
- **Supports Monitoring/Control by allowing you to:**
  - **Input actual staffing estimates for each Staff month by process area**
  - **Plot planned versus actual staffing**
  - **Generate process staffing metrics and charts**
  - **Automatically generate status review charts for staffing**

Staffing Plan and Actual Data

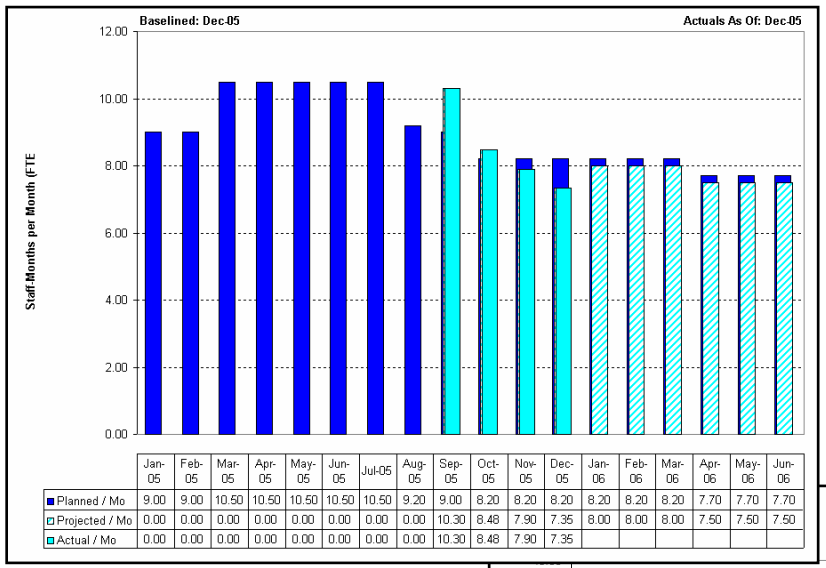
Monthly Staffing Plan																	
As Of: Dec-05																	
Task: ABC															Start of Ray's spreadsheet		
			3.20	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32	8.00	8.50	9.00
			2003	2003	2003	2003	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004
Name	Role	Proc Wo	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Jim	PDL	Mgmt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Jim	PDL	ReqEng																
Alice	DTL	Mgmt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.50	1.00
Alice	DTL	ReqEng																
Joe	DE	Dev	0.60	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50			
Mike	DE	Dev																
Pete	DE	Dev		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.50	0.50	0.50
Alan	DE	Dev		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Steve	DE	Dev		0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	1.00	1.00	1.00
Jack	DE	Dev		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.50	0.50	0.50
dave	DE	Dev		0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.50	0.50	0.50
Dennis	DE	Dev														1.00	1.00	1.00
Mark	DE	Dev														1.00	1.00	1.00
Jay	DE	Dev																
Lisa	DTL	Mgmt	0.60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lisa	DTL	ReqEng																
Bob	DE	Dev														0.50	0.50	0.50

Planned effort is input for the duration of the effort.

Actual effort is recorded monthly in collection worksheet that compares planned versus actual data.

As Of: Dec-05			9.00	8.20	8.20	8.20	8.20	8.20	8.20	7.70	7.70	7.70	7.70
Task: ABC			10.30	8.48	7.90	7.35	8.00	8.00	8.00	7.50	7.50	7.50	7.50
			10.30	8.48	7.90	7.35	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			2005	2005	2005	2005	2006	2006	2006	2006	2006	2006	2006
Name	Role	Proc Wo	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Jim	PDL	Mgmt	0.90	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Jim	PDL	ReqEng		0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Alice	DTL	Mgmt	0.90	0.80	0.80	0.65	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Alice	DTL	ReqEng		0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Joe	DE	Dev	0.70	0.20	0.10	0.43	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Mike	DE	Dev											
Pete	DE	Dev	0.40	0.40	0.20	0.30	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Alan	DE	Dev	1.00	1.00	1.00	0.07	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Steve	DE	Dev	1.00	1.00	0.80	0.95	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Jack	DE	Dev											
dave	DE	Dev	1.00	0.50	0.50	0.75	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Dennis	DE	Dev	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Mark	DE	Dev	1.00	1.00	1.00	0.70	1.00	1.00	1.00	0.50	0.50	0.50	0.50
Jay	DE	Dev	1.00	0.30	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Lisa	DTL	Mgmt	0.90	0.80	0.80	0.65	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Lisa	DTL	ReqEng		0.10	0.10	0.35	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Bob	DE	Dev	0.50	0.38	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50

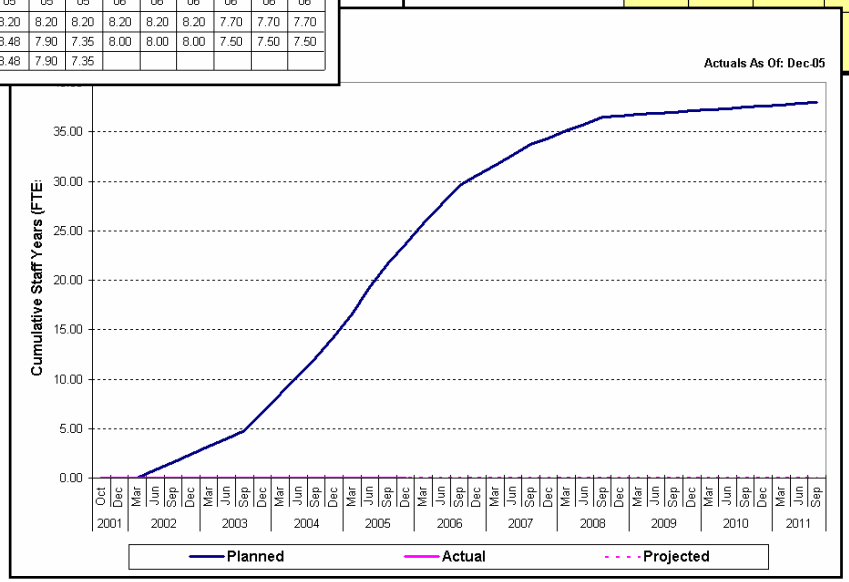
Staffing Charts



	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06
Planned / Mo	9.00	9.00	10.50	10.50	10.50	10.50	10.50	9.20	9.00	8.20	8.20	8.20	8.20	8.20	8.20	7.70	7.70	7.70
Projected / Mo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.30	8.48	7.90	7.35	8.00	8.00	8.00	7.50	7.50	7.50
Actual / Mo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.30	8.48	7.90	7.35						

Monthly Effort by Process Area — Actuals As Of: Dec-05

Process Area	Planned Effort	Actual Effort	Variance	% Var.	Analysis and Corrective Actions	Process Comments
Management	2.40	2.10	0.30	13%	A portion of the management effort this month was allocated to support the V&V. No CA needed.	The Product Plan was signed by the Project and has been baselined.
Project Planning						
Project Monitoring & Control						
Risk Management						
Software Acquisition Mgmt						
Configuration Management	0.00	0.00	0.00	0%		
Measurement & Analysis	0.00	0.00	0.00	0%	One M&A staff member worked additional hours to make up for an extended vacation last month. No CA needed.	
Process and Product QA	0.00	0.00	0.00	0%		
Engineering	0.30	0.55	-0.25	-83%	Unplanned time was spent this month updating requirements for Sub A, Sub B, and Sub C Build 2. No CA needed.	
Requirements Development						
Requirements Management						
Development & Test Environment Engineering	0.00	0.00	0.00	0%		
Development	5.50	4.70	0.80	15%	Some planned time was not worked due to vactions taken in conjunction with holidays.	
				0%	A portion of the management effort this month was allocated to support the V&V. No CA	



Stakeholder Involvement Tool

- Provides a template for a stakeholder involvement plan
- Includes a list of stakeholders that should be considered for inclusion
- Includes a list of activities that the stakeholders are normally involved in
- Includes a monitoring log to help ensure the expected stakeholder involvement is occurring
- Should be customized for each project

Stakeholder Involvement Worksheets

Project Stakeholder Process Involvement Table

Involvement type: Approval (A) Primary (P) Provide Input (I) Monitor (M) Review (R)	Internal Stakeholders				External Stakeholders										Involvement Artifacts
	Team Lead	Developers	Testers	Configuration Manager	PPQA Personnel	SPI Quick Look Team (process Audits)	Branch Management	Project Systems Engineer	IV&V Project Manager	Resource or Procurement Contact	Additional Stakeholder 1	Additional Stakeholder 2	...	Additional Stakeholder n	
Project Planning															
Product Plan Review															Emails about reviews; Review comments; Product Plan drafts, revisions, and final document; signature page of baselined document
Project Monitoring and Control															
Branch Status Reviews (BSRs)															BSR attendance sheets, BSR minutes, and action items
Milestones Reviews															Life cycle review attendance sheets and RFA forms
Measurement and Analysis															
Planning															Planning meeting minutes and Measurement Plan with list of measures and analyses
Actual Collection and Reporting															Measurement data and analysis in measurement spreadsheets or BSR, plus ISD measurement reporting
Risk Management															
Monitor risk status															Risk slides from BSR, evidence of periodic monitoring and updating of the Risk
Implement risk mitigation plans															Mitigation information in Risk Repository and
Configuration Management															
Review of Configuration Management Plan															

Date	Stakeholder Involvement Status

Provides a list of stakeholders, where they participate, and their role.

Also provides a monitoring log to ensure that stakeholder participation is taking place.

Training Tool

- Used to capture the training necessary for individuals to perform their roles effectively
- Allows the user to build a training plan for each role on the project
- Supports training monitoring to track specific training for each project employee

Training Tool Example

The plan shows mandatory and suggested training.

My Project Team Training Status	Training	CMMI Overview	Process Overview	Risk Management Tool	CM/DCR Tool - e.g., MKS	Req. Mgmt. Tool	Training Records Tool	Tool Administration (All)	GFE, if applicable - e.g., ASIS	Electro-Static Discharge	Product Plan Walkthru	SQA Plan Walkthru	Schedule Walkthru	Requirements Walkthru	Test Plan Walkthru	CMMI Appraisal Preparation Workshop(s)	Additional training name
Last Updated: 8/21/07	**Provider**	SPI	SPI	Branch/Org	Vendor	PDL or Vendor	Branch/Org	Branch/Org	GSFC	GSFC	PDL	SQE	PDL	PDL	PDL	SPI	Provider
Name	**Role**																
Jane	PDL	M	M 08/21/07	M Prof	O	M Prof			M 07/15/07	M Prof	M	M	M	M	M	M	
Joe	DE	O		O	O				M 07/15/07								
Jack	DE	O		O	O				M 07/15/07								
Jason	DE	O		O	O				M 07/15/07								
Jennie	TE	O		O	O				M 07/15/07	M Prof				O	O		
Jim	TE	O		O	O				M 07/15/07	M Prof				O	O		
Jim	CMO	M	08/21/07		M Prof			O	O 07/15/07							M	

Key:	
M	Mandatory
O	Optional (but recommended)
	Training not specified
6/1/07	Training completed on date indicated
PROF	Proficiency achieved - no training required

It also shows completed training relative to the plan.

WBS Checklist

- Provides a comprehensive list of possible Work Breakdown Structure (WBS) elements to be considered for inclusion in your WBS
- Use the checklist as a starting point, eliminating those elements that don't apply and adding or expanding elements as necessary
- WBS Elements that support CMMI process areas are noted as required

WBS Checklist Tool Top Levels

1 PROJECT MANAGEMENT
- 1.1 Project Planning
- 1.2 Project Monitoring and Control
- 1.3 Configuration Management
- 1.4 Quality Assurance Support
- 1.5 Stakeholder Coordination
- 1.6 Acquisition Management

2 SYSTEMS ENGINEERING
- 2.1 System Definition and Design
- 2.2 Requirements Engineering
- 2.3 Interface engineering
- 2.4 Specialty Engineering
- 2.5 Development and Test Environment Engineering
- 2.6 Post Development Support

3 HARDWARE
- 3.1 Hardware Configuration Item 1 (repeat for each CI)
- 3.n Hardware Subsystem Support

4 SOFTWARE
- 4.1 Software Configuration Item 1 (repeat for each CI)

5 DATABASE
- 5.1 Database Development
- 5.2 Data Preparation

6 SYSTEM TEST AND EVALUATION
- 6.1 Test Preparation
- 6.2 Test Conduct

7 SITE ACTIVATION
- 7.1 Perform Site Surveys
- 7.2 Perform Site Preparation
- 7.3 Perform Site Installation

8 TRAINING
- 8.1 Team Training
- 8.2 Customer/User Training

9 SYSTEM OPERATIONS AND MAINTENANCE
- 9.1 Operations Preparation
- 9.2 Operations Activities

What the Checklist Looks Like

1 PROJECT MANAGEMENT			
1.1	Project Planning		
1.1.1	Plan the Technical Approach	Plan the technical (and engineering) approach	Required
1.1.2	Plan the Management Approach	Plan the management approach, including: Estimate (and re-estimate) project costs Plan (and replan) the project staff Plan the monitoring and control approach and activities Plan the measurement and analysis activities Plan the Data Management approach Identify initial risks and develop risk strategy Create (and maintain) the schedule of work (based on the WBS) Identify the number of builds planned and the basic build contents	
1.1.3	Develop and Maintain the SMP/PP	Write, review, and maintain the management plan based on the approved template.	
1.2	Project Monitoring and Control		
1.2.1	Prepare Measurement Environment	Install the metric tools and repositories as needed	Required
1.2.1	Perform Monitoring Activities	Monitor and control the effort through the following activities: Collect and store metric data monthly Compare actual data to plan monthly Analyze metric data monthly Get status from Team leads or members weekly Identify, track, and resolve issues and actions Review the risks and update status at least monthly Verify that data management activities are ongoing Track receivables against the schedule	
1.2.3	Prepare and Report	Report status to management and stakeholders; track and resolve issues and actions identified during reporting	
1.3	Configuration Management		
1.3.1	Plan CM Approach	Plan the CM approach (you may tailor an organizational approach); write and maintain the CM Plan; select, obtain, and install CM tools	
1.3.2	Conduct CCBs	Assess and manage configured items (requirements, software,	
1.3.3	Baselin Configu		
1.3.4	Build D Configu		
1.3.5	Resolve Audit F		

2 SYSTEMS ENGINEERING			
2.1	System Definition and Design		
2.1.1	Develop System Concept Definition	Develop (or support) the overall system concept	
2.1.2	Perform Trade Studies and Engineering Analyses	Perform trade studies, feasibility studies, etc.	
2.1.3	Perform Make/Buy and COTS/GOTS decisions	Based on system concept and design, perform make/buy studies; for components that are not "make", conduct COTS/GOTS analysis and make recommendations	
2.1.4	Develop Architecture Definition	Develop (or support) the overall system architecture	
2.1.5	Develop System Design	Develop (or support) the overall system design	
2.2	Requirements Engineering		
2.2.1	Define and Analyze Requirements	Analyze, define, and document the system requirements; allocate them to system components; create and maintain a bi-directional requirements traceability matrix.	Required
2.2.2	Perform Requirements Management	Implement requirement change control	
2.3	Interface Engineering		
2.3.1	Define Interfaces	Define and document system and subsystem interface requirements and design	Required

3 HARDWARE			
3.1	Hardware Configuration Item 1 (repeat for each CI)		
3.1.1	Define HW Requirements	Develop and document the hardware requirements	Required for hardware
3.1.2	Define HW Preliminary Design	Develop a high-level hardware design and conduct a review	
3.1.3	Define HW Detailed Design	Develop the detailed hardware design and conduct a review	
3.1.4	Perform HW Acquisition and Verification	Acquire the hardware components and verify that they meet specifications	
3.1.5	Perform HW Integration and Checkout	Integrate the hardware and verify performance of the integrated hardware system	
3.2	Hardware Configuration Item 2		
3.3	Hardware Configuration Item 3		
3.4	Hardware Subsystem Support		
3.4.1	Develop HW Diagnostics	Develop any hardware diagnostics that are required	
3.4.2	Support Special HW/SW Tests	Support the customer in any special hardware/software testing	
3.4.3	Support HW I&T	Support the customer in integration and test activities	
3.4.4	Support Payload I&T	Provide support for integration and test of any payload systems	

4 SOFTWARE			
4.1	Software Configuration Item 1 (repeat for each CI)		
4.1.1	Develop SW Requirements **(SEE NOTE)**	Develop software requirements; analyze system requirements to identify, expand, and clarify software requirements; document the software requirements in accordance with the project standard; and conduct a Software Requirements Review to ensure stakeholder agreement	Required for software or firmware implementation
4.1.2	Develop SW Design **(SEE NOTE)**	Develop the high-level software design; conduct a Preliminary Design Review to ensure stakeholder agreement; develop the detailed design; document the design in accordance with the project standard; conduct a Critical Design Review to ensure stakeholder agreement	
4.1.3	Implement Build 1	Develop the software for the build; unit-test the software; integrate the units and perform developer testing on the build; perform independent testing on the Build, including development of test requirements, test plans, test scenarios, and test procedures; document test results.	
4.1.4	Implement Build 2	Develop Build 2 (same activities as Build 1)	
4.1.5	Implement Build 3	Develop Build 3 (same activities as Build 1)	
4.2	Software Configuration Item 2		
4.3	Software Configuration Item 3		

NOTE: Requirements and design can be conducted for all CSCIs jointly, with only the implementation effort broken into separate WBS elements for each CSCI.

7 SITE ACTIVATION		
7.1	Perform Site Surveys	Determine what, if anything, needs to be done to the site prior to system installation and operation
7.2	Perform Site Preparation	Prepare the site based on the results of the site survey (e.g., upgrade air conditioning, adjust room partitions).
7.3	Perform Site Installation	Install the hardware and software components in the operational environment

8 TRAINING		
8.1	Team Training	
	ing	Required
		Required if training is needed
		Required
		Required if training is needed

Summary

- There are many free tools available to projects
- Many have been developed by the Goddard SPI organization
- More tools are being added regularly
- To see available tools click the Tools tab at

  http://software.gsfc.nasa.gov/
- Contact the SPI for assistance or questions

Questions?

Acronyms

- AI – Action Item
- AM – Acquisition Manager
- BSR – Branch Status Review
- BOE – Basis of Estimate
- CCB – Configuration Control Board
- CI – Configuration item
- CMMI – Capability Maturity Model Integration
- CMO – Configuration Management Officer
- CO – Contracting Officer
- COTR – Contracting Officer's Technical Representative
- CSCI – Computer Software Configuration item
- DE – Development Engineer
- DTL – Development Team Lead
- ID – Identifier
- MGR – Line Manager
- ME – Maintenance Engineer
- MTL – Maintenance Team Lead

Acronyms

- NPR – NASA Procedural Requirement
- PDL – Product Development Lead
- PP – Product Plan
- QSM – Quantitative Software Management
- RID – Review Item Disposition
- SE – System Engineer
- SM – Software Manager
- SMP – Software Management Plan
- SPI – Software Process Improvement
- SQE – Software Quality Engineer
- STE – Simulator/Tools Engineer
- STR – Software Technology Researcher
- TBD – To Be Determined
- TE – Test Engineer
- TTL – Test Team Lead
- WBS – Work Breakdown Structure